

CLAIMS

What is claimed is:

1. A receive chain enabled state switching method, comprising:

receiving, by a first multi-link device by using a first link, a first frame sent by a second multi-link device to the first multi-link device; and

making, by the first multi-link device, one or more second links be in a multi-receive-chain enabled state, wherein the second link is a link that is between the first multi-link device and the second multi-link device and that is different from the first link;

wherein the first multi-link device has a plurality of stations, and the second multi-link device includes a plurality of access points.

2. The method according to claim 1, wherein after the receiving, by a first multi-link device by using a first link, a first frame sent by a second multi-link device, the method further comprises: making, by the first multi-link device, the first link be in the multi-receive-chain enabled state.

3. The method according to claim 1 or 2, wherein after the making, by the first multi-link device, one or more second links be in a multi-receive-chain enabled state, the method further comprises:

performing, by the first multi-link device, frame interaction with the second multi-link device by using the second link, and switching, by the first multi-link device, the state of the second link to a single-receive-chain enabled state when a frame interaction sequence on the second link ends,

or

switching, by the first multi-link device, the state of the second link to a single-receive-chain enabled state when the first multi-link device does not receive, by using the second link within predetermined time, any frame sent by the second multi-link device to the first multi-link device; or

switching, by the first multi-link device, the state of the second link to a single-receive-chain enabled state when the first multi-link device receives, by using the second link, a second frame sent by the second multi-link device, wherein the second frame is used for indicating to switch the state of the second link to the single-receive-chain enabled state.

4. The method according to any one of claims 1 to 3, wherein the second link is a link corresponding to a station in an awake state in the first multi-link device.

5. The method according to any one of claims 1 to 4, wherein the first frame carries a traffic

identifier (TID), and the second link is a link mapped to the TID.

6. The method according to any one of claims 1 to 4, wherein after the making, by the first multi-link device, one or more second links be in a multi-receive-chain enabled state, the method further comprises:

5 receiving, by the first multi-link device by using the first link, a third frame sent by the second multi-link device to the first multi-link device, wherein the third frame comprises a traffic identifier (TID); and

switching, by the first multi-link device, a state of a target link in the one or more second links to the single-receive-chain enabled state, wherein the target link is a link not mapped to the
10 TID in the one or more second links.

7. The method according to any one of claims 1 to 4, wherein the first frame carries indication information used for indicating the one or more second links, and before the making, by the first multi-link device, one or more second links be in a multi-receive-chain enabled state, the method further comprises:

15 determining, by the first multi-link device, the one or more second links based on the indication information.

8. The method according to claim 7, wherein the first frame is a data frame, the first frame comprises a high throughput control (HT control) field of a high efficiency (HE) type, the high throughput control field comprises an A-control subfield, the A-control subfield comprises a
20 control subfield, the control subfield comprises a control information subfield and a control identifier (control ID) subfield, the control information subfield carries the indication information, the control identifier subfield carries a control identifier, and the control identifier is used for indicating that the control information subfield carries the indication information.

9. The method according to claim 7, wherein the first frame is a control frame, and the
25 indication information is carried in the following one or more subfields in a frame control field of the first frame: a to distributed system (to DS) subfield, a from distributed system (from DS) subfield, a more fragment subfield, a retry subfield, a protected frame subfield, or a +high throughput control/order (+HTC/order) subfield.

10. The method according to claim 7, wherein the first frame is a control frame, a frame
30 control field of the first frame comprises a subtype subfield, the subtype subfield is used for indicating that the first frame carries an indication information field, and the indication information

field carries the indication information; or

a frame control field of the first frame comprises a subtype subfield, the subtype subfield is used for indicating that the first frame carries an extended control field, the extended control field is used for indicating that the first frame carries an indication information field, and the indication information field carries the indication information.

11. The method according to claim 7, wherein the first frame is a trigger frame, a user information field of the first frame comprises an association identifier AID 12 subfield, an AID subfield, and an indication information subfield, the AID 12 subfield is set to a specific value for indicating that the user information field carries the AID subfield and the indication information subfield, the AID subfield carries an identifier of a receiver, and the indication information subfield carries the indication information.

12. A first multi-link device, comprising:

a communications unit, configured to receive, by using a first link, a first frame sent by a second multi-link device to the first multi-link device; and

a processing unit, configured to make one or more second links be in a multi-receive-chain enabled state, wherein the second link is a link that is between the first multi-link device and the second multi-link device and that is different from the first link;

wherein the first multi-link device has a plurality of stations, and the second multi-link device includes a plurality of access points.

13. The device according to claim 12, wherein

the processing unit is further configured to make the first link be in the multi-receive-chain enabled state after the communications unit receives, by using the first link, the first frame sent by the second multi-link device.

14. The device according to claim 12 or 13, wherein

the communications unit is further configured to perform frame interaction with the second multi-link device by using the second link after the processing unit makes the one or more second links be in the multi-receive-chain enabled state; and the processing unit is further configured to switch the state of the second link to a single-receive-chain enabled state when a frame interaction sequence on the second link ends; or

the processing unit is further configured to switch the state of the second link to a single-receive-chain enabled state when the communications unit does not receive, by using the second

link within predetermined time, any frame sent by the second multi-link device to the first multi-link device after the processing unit makes the one or more second links be in the multi-receive-chain enabled state; or

the communications unit is further configured to receive, by using the second link, a second frame sent by the second multi-link device, wherein the second frame is used for indicating to switch the state of the second link to a single-receive-chain enabled state; and the processing unit is further configured to switch the state of the second link to the single-receive-chain enabled state.

15. The device according to any one of claims 12 to 14, wherein the second link is a link corresponding to a station in an awake state in the first multi-link device.

16. The device according to any one of claims 12 to 15, wherein the first frame carries a traffic identifier (TID), and the second link is a link mapped to the TID.

17. The device according to any one of claims 12 to 15, wherein

the communications unit is further configured to receive, by using the first link, a third frame sent by the second multi-link device to the first multi-link device after the processing unit makes the one or more second links be in the multi-receive-chain enabled state, wherein the third frame comprises a traffic identifier (TID); and

the processing unit is further configured to switch a state of a target link in the one or more second links to the single-receive-chain enabled state, wherein the target link is a link not mapped to the TID in the one or more second links.

18. The device according to any one of claims 12 to 15, wherein the first frame carries indication information used for indicating the one or more second links, and

the processing unit is further configured to determine the one or more second links based on the indication information before making the one or more second links be in the multi-receive-chain enabled state.

19. The device according to claim 18, wherein the first frame is a data frame, the first frame comprises a high throughput control (HT control) field of a high efficiency (HE) type, the high throughput control field comprises an A-control subfield, the A-control subfield comprises a control subfield, the control subfield comprises a control information subfield and a control identifier (control ID) subfield, the control information subfield carries the indication information, the control identifier subfield carries a control identifier, and the control identifier is used for indicating that the control information subfield carries the indication information.

20. The device according to claim 18, wherein the first frame is a control frame, and the indication information is carried in the following one or more subfields in a frame control field of the first frame: a to distributed system (to DS) subfield, a from distributed system (from DS) subfield, a more fragment subfield, a retry subfield, a protected frame subfield, or a +high throughput control/order (+HTC/order) subfield.

21. The device according to claim 18, wherein the first frame is a control frame, a frame control field of the first frame comprises a subtype subfield, the subtype subfield is used for indicating that the first frame carries an indication information field, and the indication information field carries the indication information; or

a frame control field of the first frame comprises a subtype subfield, the subtype subfield is used for indicating that the first frame carries an extended control field, the extended control field is used for indicating that the first frame carries an indication information field, and the indication information field carries the indication information.

22. The device according to claim 18, wherein the first frame is a trigger frame, a user information field of the first frame comprises an association identifier AID 12 subfield, an AID subfield, and an indication information subfield, the AID 12 subfield is set to a specific value for indicating that the user information field carries the AID subfield and the indication information subfield, the AID subfield carries an identifier of a receiver, and the indication information subfield carries the indication information.

23. A communications apparatus, comprising at least one processor and a communications interface, wherein

the processor runs computer programs, to perform the method according to any one of claims 1 to 11.

24. A computer-readable storage medium, wherein the computer-readable storage medium is configured to store computer programs, and when the computer programs are executed, the method according to any one of claims 1 to 11 is implemented.

25. A communication apparatus, wherein the communication apparatus is configured to perform the method according to any one of claims 1 to 11.

26. A program, wherein when the program is executed by a computer, the method according to any one of claims 1 to 11 is implemented.